

Primary framework for mathematics: learning objectives

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1 Using and applying mathematics

Solve problems involving counting, adding, subtracting, doubling or halving in the context of numbers, measures or money, for example to 'pay' and 'give change'

Solve problems involving addition, subtraction, multiplication or division in contexts of numbers, measures or pounds and pence

Solve one-step and two-step problems involving numbers, money or measures, including time, choosing and carrying out appropriate calculations

Describe a puzzle or problem using numbers, practical materials and diagrams; use these to solve the problem and set the solution in the original context

Identify and record the information or calculation needed to solve a puzzle or problem; carry out the steps or calculations and check the solution in the context of the problem

Represent the information in a puzzle or problem using numbers, images or diagrams; use these to find a solution and present it in context, where appropriate using £.p notation or units of measure

Answer a question by selecting and using suitable equipment, and sorting information, shapes or objects; display results using tables and pictures

Follow a line of enquiry; answer questions by choosing and using suitable equipment and selecting, organising and presenting information in lists, tables and simple diagrams

Follow a line of enquiry by deciding what information is important; make and use lists, tables and graphs to organise and interpret the information

Describe simple patterns and relationships involving numbers or shapes; decide whether examples satisfy given conditions

Describe patterns and relationships involving numbers or shapes, make predictions and test these with examples

Identify patterns and relationships involving numbers or shapes, and use these to solve problems

Describe ways of solving puzzles and problems, explaining choices and decisions orally or using pictures

Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences

Describe and explain methods, choices and solutions to puzzles and problems, orally and in writing, using pictures and diagrams

2 Counting and understanding number

Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same; estimate a number of objects that can be checked by counting

Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers

Read, write and order whole numbers to at least 1000 and position them on a number line; count on from and back to zero in single-digit steps or multiples of 10

Compare and order numbers, using the related vocabulary; use the equals (=) sign

Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1

Partition three-digit numbers into multiples of 100, 10 and 1 in different ways

Read and write numerals from 0 to 20, then beyond; use knowledge of place value to position these numbers on a number track and number line

Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs

Round two-digit or three-digit numbers to the nearest 10 or 100 and give estimates for their sums and differences

Say the number that is 1 more or less than any given number, and 10 more or less for multiples of 10

Estimate a number of objects; round two-digit numbers to the nearest 10

Read and write proper fractions (e.g. $\frac{3}{7}$, $\frac{9}{10}$), interpreting the denominator as the parts of a whole and the numerator as the number of parts; identify and estimate fractions of shapes; use diagrams to compare fractions and establish equivalents

Use the vocabulary of halves and quarters in context

Find one half, one quarter and three quarters of shapes and sets of objects

3 Knowing and using number facts

Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts

Derive and recall all addition and subtraction facts for each number to at least 10, all pairs with totals to 20 and all pairs of multiples of 10 with totals up to 100

Derive and recall all addition and subtraction facts for each number to 20, sums and differences of multiples of 10 and number pairs that total 100

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Count on or back in ones, twos, fives and tens and use this knowledge to derive the multiples of 2, 5 and 10 to the tenth multiple	Understand that halving is the inverse of doubling and derive and recall doubles of all numbers to 20, and the corresponding halves	Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables and the corresponding division facts; recognise multiples of 2, 5 or 10 up to 1000
Recall the doubles of all numbers to at least 10	Derive and recall multiplication facts for the 2, 5 and 10 times-tables and the related division facts; recognise multiples of 2, 5 and 10	Use knowledge of number operations and corresponding inverses, including doubling and halving, to estimate and check calculations
	Use knowledge of number facts and operations to estimate and check answers to calculations	
4 Calculating		
Relate addition to counting on; recognise that addition can be done in any order; use practical and informal written methods to support the addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number	Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers	Add or subtract mentally combinations of one-digit and two-digit numbers
Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number and a multiple of 10 from a two-digit number	Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences	Develop and use written methods to record, support or explain addition and subtraction of two-digit and three-digit numbers
Solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups	Represent repeated addition and arrays as multiplication, and sharing and repeated subtraction (grouping) as division; use practical and informal written methods and related vocabulary to support multiplication and division, including calculations with remainders	Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect
Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences	Use the symbols +, -, ×, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. $\square \div 2 = 6$, $30 - \square = 24$)	Use practical and informal written methods to multiply and divide two-digit numbers (e.g. 13×3 , $50 \div 4$); round remainders up or down, depending on the context
		Understand that division is the inverse of multiplication and vice versa; use this to derive and record related multiplication and division number sentences
		Find unit fractions of numbers and quantities (e.g. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ of 12 litres)
5 Understanding shape		
Visualise and name common 2-D shapes and 3-D solids and describe their features; use them to make patterns, pictures and models	Visualise common 2-D shapes and 3-D solids; identify shapes from pictures of them in different positions and orientations; sort, make and describe shapes, referring to their properties	Relate 2-D shapes and 3-D solids to drawings of them; describe, visualise, classify, draw and make the shapes
Identify objects that turn about a point (e.g. scissors) or about a line (e.g. a door); recognise and make whole, half and quarter turns	Identify reflective symmetry in patterns and 2-D shapes and draw lines of symmetry in shapes	Draw and complete shapes with reflective symmetry; draw the reflection of a shape in a mirror line along one side
Visualise and use everyday language to describe the position of objects and direction and distance when moving them, for example when placing or moving objects on a game board	Follow and give instructions involving position, direction and movement	Read and record the vocabulary of position, direction and movement, using the four compass directions to describe movement about a grid
	Recognise and use whole, half and quarter turns, both clockwise and anticlockwise;	Use a set-square to draw right angles and to identify right angles in 2-D shapes;

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know that a right angle represents a quarter turn

compare angles with a right angle; recognise that a straight line is equivalent to two right angles

6 Measuring

Estimate, measure, weigh and compare objects, choosing and using suitable uniform non-standard or standard units and measuring instruments (e.g. a lever balance, metre stick or measuring jug)

Estimate, compare and measure lengths, weights and capacities, choosing and using standard units (m, cm, kg, litre) and suitable measuring instruments

Know the relationships between kilometres and metres, metres and centimetres, kilograms and grams, litres and millilitres; choose and use appropriate units to estimate, measure and record measurements

Use vocabulary related to time; order days of the week and months; read the time to the hour and half hour

Read the numbered divisions on a scale, and interpret the divisions between them (e.g. on a scale from 0 to 25 with intervals of 1 shown but only the divisions 0, 5, 10, 15 and 20 numbered); use a ruler to draw and measure lines to the nearest centimetre

Read, to the nearest division and half-division, scales that are numbered or partially numbered; use the information to measure and draw to a suitable degree of accuracy

Use units of time (seconds, minutes, hours, days) and know the relationships between them; read the time to the quarter hour; identify time intervals, including those that cross the hour

Read the time on a 12-hour digital clock and to the nearest 5 minutes on an analogue clock; calculate time intervals and find start or end times for a given time interval

7 Handling data

Answer a question by recording information in lists and tables; present outcomes using practical resources, pictures, block graphs or pictograms

Answer a question by collecting and recording data in lists and tables; represent the data as block graphs or pictograms to show results; use ICT to organise and present data

Answer a question by collecting, organising and interpreting data; use tally charts, frequency tables, pictograms and bar charts to represent results and illustrate observations; use ICT to create a simple bar chart

Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects

Use lists, tables and diagrams to sort objects; explain choices using appropriate language, including 'not'

Use Venn diagrams or Carroll diagrams to sort data and objects using more than one criterion